Overview of recent Bruyères-le-Châtel actinide evaluations

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Over the last five years, new evaluations of plutonium and uranium have been performed at Bruyères-le-Châtel from the resolved resonance region up to 30 MeV. Only nuclear reactions models have been used to build these evaluations. Total, shape elastic and direct inelastic cross sections are obtained from a coupled channel model using a dispersive optical potential devoted to actinides. All the other cross sections are calculated owing to the Hauser-Fesbach theory. We take particular care over the fission channel. For uranium isotopes, a triple-humped barrier is required in order to reproduce accurately the variations of the experimental fission cross sections. With increasing neutron incident energy, a lot of residual nuclei produced by nucleon emission lead to fission also. All available experimental data assigned to the various fission mechanisms of the same nucleus are used to define its fission barrier parameters. As a result of this approach, we are now able to provide consistent evaluations for a large series of isotopes. Integral data testing results of our new evaluations will be presented.

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